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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,785	08/21/2003	Takahiro Amanai	12577/20	6921

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/644,785

Applicant(s)

AMANAI, TAKAHIRO

Examiner

Arnel C. Lavarias

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/2/04, 8/21/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/2/04, 8/21/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/21/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The English translations of the specification, abstract, claims, and drawings in the submission dated 3/2/04 are acknowledged and accepted.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 7/13/01. It is noted, however, that applicant has not filed a certified copy of the 2001-213283 application as required by 35 U.S.C. 119(b).
3. Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon an application filed in Japan on 7/13/01. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on said application, since the United States application was filed more than twelve months thereafter.

Drawings

4. The originally filed drawings were received on 8/21/03. The replacement formal drawings were received on 3/2/04. These drawings are acceptable.

Claim Objections

5. Claims 11-12 are objected to because of the following informalities:

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Claim 11 recites "an external" in line 4. It is not certain what is intended by this term.

For purposes of examination, this limitation has been taken to mean "an external source".

Similarly, Claim 12 recites "an external" in line 4. It is not certain what is intended by this term. For purposes of examination, this limitation has been taken to mean "an external source".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-12 are rejected under 35 U.S.C. 102(a) as being anticipated by Amauchi (JP 2003029343 A).

Amauchi discloses an image display apparatus (See for examples Figures 2, 4, 6, 8-13) comprising a display element that displays a picture (See for example 5 in Figure 2); a projecting optical system that forms a real image of the picture (See for example 6 in Figure 2); and a diffusive hologram screen (See for example 1/1a in Figure 2) disposed at a position of the real image or in a vicinity thereof, wherein the diffusive hologram screen has a predetermined directionality, to thereby introduce, when an operator uses the image display apparatus held in his hand, the picture displayed on the image display element

exclusively into a pupil of the operator (See Abstract). Amauchi additionally discloses the following condition being satisfied: $0.01 < \frac{Y}{D} < 2.7$ (See Abstract; Paragraphs 0012-0014); the following condition being satisfied: $0.3^\circ < \theta < 54.0^\circ$ (See Paragraphs 0015-0018); the following condition being satisfied: $0.3^\circ < \delta < 54.0^\circ$ (See Paragraphs 0019-0022); at least one of optical elements constituting the projecting optical system has a free-formed surface (See Paragraph 0027); the diffusive hologram screen is a reflection-type one (See Paragraph 0028); the diffusive hologram screen is a transmission-type one (See Paragraph 0028); a screen surface of the diffusive hologram screen is shaped as a plane surface (See Figure 2); a screen surface of the diffusive hologram screen is a curved surface (See Figure 8); the diffusive hologram screen is arranged in such a manner that a screen surface thereof is tilted in reference to the operator and is perpendicular to an axial chief ray of the projecting optical system (See Figure 9); a personal data assistant (See Figures 10-11) including an image display apparatus as set forth in Claim 1, operation buttons via which the operator inputs and outputs data from an external source, a data processor connected with the operation buttons, a storage device connected with the data processor, and a transceiver unit connected with the data processor; and a cellular phone (See Figures 12-13) including an image display apparatus as set forth in Claim 1, operation buttons via which the operator inputs and outputs data from an external source, an audio input unit for inputting audio data derived from the operator, and an audio output unit for outputting audio data transmitted from a mate correspondent of the operator.

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8. Claims 1-2, 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ono '677 (JP 2000-284677A).

Ono '677 discloses an image display apparatus (See for examples Figures 1, 3) comprising a display element that displays a picture (See 23 in Figure 1; 43 in Figure 3); a projecting optical system that forms a real image of the picture (See 23 in Figure 1; 43 in Figure 3; Paragraph 0027); and a diffusive hologram screen (See 22 in Figure 1; 42 in Figure 3) disposed at a position of the real image or in a vicinity thereof, wherein the diffusive hologram screen has a predetermined directionality, to thereby introduce, when an operator uses the image display apparatus held in his hand, the picture displayed on the image display element exclusively into a pupil of the operator (See Abstract; Figures 1, 3). Ono '677 additionally discloses the following condition being satisfied:

$$0.01 < \frac{Y}{D} < 2.7 \text{ (See Paragraphs 0021-0026; wherein the ratio ranges from .25}$$

(Y=100mm and D=400mm) to .60 (Y=90mm and D=150mm)); the diffusive hologram screen is a reflection-type one (See Figure 1); the diffusive hologram screen is a transmission-type one (See Figure 3); and a screen surface of the diffusive hologram screen is shaped as a plane surface (See 22 in Figure 1; 42 in Figure 3).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono '677 in view of Ono '461 (U.S. Patent Application Publication US 2002/0021461 A1).

Ono '677 discloses the invention as set forth above in Claim 1, except for the following condition being satisfied: $0.3^{\circ} < \theta < 54.0^{\circ}$. However, Ono '461 teaches a conventional holographic display device (See for example Figures 1, 4, 6-7) which utilizes a holographic diffusive element (See 4, 60 in Figures 1, 4, 6). In particular, an embodiment of the holographic diffuser has a full width half maximum diffusion characteristic of approximately 5 degrees (See 66 in Figure 7). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the following condition be satisfied: $0.3^{\circ} < \theta < 54.0^{\circ}$, as taught by Ono '461, in the apparatus of Ono '677, for the purpose of increasing the brightness of the display image.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono '677 in view of Kanda et al. (U.S. Patent No. 6198554).

Ono '677 discloses the invention as set forth above in Claim 1, except for the following condition being satisfied: $0.3^{\circ} < \delta < 54.0^{\circ}$. However, Kanda et al. teaches a conventional display (See for example Figures 34, 37) utilizing a holographic diffuser (See 83 in Figure 34; 103 in Figure 37). In particular, Kanda et al. teaches that the maximum of the diffusion characteristic of the holographic diffuser over the entire surface of the diffuser is directed toward the viewing zone (See 93a in Figure 34; 110 in Figure 37). Though the particular angles are not explicitly disclosed, it is evident from

the disclosed embodiments (See specifically Figures 34 and 37) that the condition $0.3^\circ < \delta < 54.0^\circ$ appears to be satisfied, where δ may be defined as the angle formed between the uppermost diffused light (See uppermost diffused light 110 in Figure 37) to the observer and the middle most diffused light (See middle most diffused light 110 in Figure 37) to the observer (Each of the diffused light has a different angle of directivity, wherein all these angles of directivity are directed toward the observer. The angle δ appears to approximately 25 degrees for the embodiment shown in Figure 37.). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the following condition be satisfied: $0.3^\circ < \delta < 54.0^\circ$, as taught by Kanda et al., in the apparatus of Ono '677, for the purpose of expanding the viewing area as seen from the observer.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono '677 in view of Seufert (U.S. Patent No. 5897192).

Ono '677 discloses the invention as set forth above in Claim 1, except for at least one of the optical elements constituting the projecting optical system having a free-formed surface. However, the use of one or more free-formed elements in a projecting optical system is known in the art. For example, Seufert teaches a conventional projection module (See for example Figure 9), wherein a surface of an optical element, such as a condenser lens (See 23, 25 in Figure 9), may be constructed as a free form surface (See col. 11, line 30-col. 13, line 16; col. 18, lines 41-49). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least one of the optical elements constituting the projecting optical system have a free-formed

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surface, as taught by Seufert, in the apparatus of Ono '677, for the purpose of optimizing the brightness distribution and intensity (i.e. achieve uniform brightness) of the incident light generated by the light source in the projecting optical system.

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono '677 in view of Hildebrand et al. (U.S. Patent No. 6094181).

Ono '677 discloses the invention as set forth above in Claim 1, except for the screen surface of the diffusive hologram screen being a curved surface. However, Hildebrand et al. teaches a conventional miniature electronic display (See for example Figures 6, 9, 13-15), wherein the diffusing optical element (See for example 24 in Figure 9; col. 10, lines 35-45) may be curved. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the screen surface of the diffusive hologram screen be a curved surface, as taught by Hildebrand et al., in the apparatus of Ono '677, for the purpose of providing field curvature matching, thus allowing for high fields of view.

14. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono '677 in view of Hockley et al. (U.S. Patent No. 5046793).

Ono '677 discloses the invention as set forth above in Claim 1, except for the diffusive screen being arranged in such a manner that a screen surface thereof is tilted in reference to the operator and is perpendicular to an axial chief ray of the projecting optical system. However, Hockley et al. teaches a conventional projection system (See for example Figures 3-5) utilizing a holographic diffuser (See for example 50 in Figure 5). In particular, Hockley et al. teaches that the diffusive screen may be arranged in such a

manner that a screen surface thereof is tilted in reference to the operator (See 52 in Figure 5) and is perpendicular to an axial chief ray of the projecting optical system (See 59 in Figure 5). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diffusive screen be arranged in such a manner that a screen surface thereof is tilted in reference to the operator and is perpendicular to an axial chief ray of the projecting optical system, as taught by Hockley et al., in the apparatus of Ono '677, for the purpose of simplifying the optical system, since deflecting optical elements, such as mirrors or reflectors, are not required to route the light from the source to the holographic diffuser.

15. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono '677 in view of Hildebrand et al.

Ono '677 discloses the invention as set forth above in Claim 1, except for the image display being a part of a personal data assistant or cellular phone, wherein the personal data assistant includes buttons, a data processor, a storage device, and a transceiver, and the cellular phone including buttons, an audio input unit, and an audio output unit. However, Hildebrand et al. teaches a conventional miniature electronic display (See for example Figures 6, 9, 13-15), which may be utilized in personal data assistants or cellular phones (See col. 7, lines 34-51). Official notice is taken of the fact that it is well known in the art for personal data assistants to include buttons (for inputting data into the personal data assistant), a data processor (such as a CPU, for processing the input data), a storage device (to store the input data), and a transceiver (such as a wireless or wired link to communicate with another host such as a computer or another personal data assistant).

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Official notice is also taken of the fact that it is well known in the art for cellular phones to include buttons (for inputting data into the cellular phone), an audio input unit (such as a microphone, for inputting speech into the cellular phone), and an audio output unit (such as a speaker, to allow one to listen to audio from the cellular phone). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the image display be a part of a personal data assistant or cellular phone, as taught by Hildebrand et al., in the apparatus of Ono '677, to take advantage of the small size of the display to reduce the size of the personal data assistant and cellular phone.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
Patent Examiner
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5/6/06